	Mm. of Water Column
Upward pressure in combustion chamber.....	+26.20
Upward pressure in checkerwork.....	-f 24.60
Difference or positive pressure acting at chimney valve	-f- 1.60
Draft depression at chimney valve.....	— 38.00
Draft depression at chimney valve due to stack will therefore be. . .	—36.40
Upward pressure in checker.....	-f- 24.60
Draft depression in dome of stove due to chimney.....	— 11.80
Upward pressure in combustion chamber.....	+26.20
Making a draft depression at the burner available to draw in the air required for combustion.....	— 38.00

Professor Groume-Grjimailo has suggested that combustion conditions in the two-pass Cowper stove may be improved by springing an arch across the chamber with an opening proportioned to retard the flow of the gases to such an extent that combustion occurs in the chamber. The location of the arch will be fixed by the amount of gas burned and the time required for combustion. Two seconds may be allowed for combustion, which will be very rapid under incandescent chamber conditions, with good mixing. The size of the chamber and the port may be arrived at as follows:

Chamber volume = 25.67 X 2 = 51 m^3 34,
Height of chamber = 51.34 -r- 3.79 = 13 m 60.

It is necessary to provide an opening in the arch over the top of the combustion chamber which will permit the waste gases to escape and yet restrict their flow sufficiently to supply time for the completion of combustion. The area of this opening may be determined by the use of Yesmann's formula, as follows:

in which Q = the quantity of gas flowing, in cubic meters per
second; for the case in hand, Qi2oo= 25 m^3 67;
H=the head at the orifice or the vertical distance from
the orifice to the lower free surface of the gases;
for the case in hand 77 = 13 m 60;
2g = gravitational constant = 2 X9.81 = 19.62;